

WHAT IS CLAIMED IS:

1. A valve seat, press-fitted into a cylinder head of an internal combustion engine, containing an iron-based sintered alloy, comprising:

- a valve-seating section; and
- a head-seating section,

wherein the valve-seating section and the head-seating section are monolithically formed by a sintering process and form a double layer structure, the valve-seating section includes a first iron-based sintered alloy member that has a porosity of 10 to 25 percent by volume and a sintered density of 6.1 to 7.1 g/cm³ and contains hard particles dispersed in a matrix phase, and the head-seating section includes a second iron-based sintered alloy member that has a porosity of 10 to 20 percent by volume and a sintered density of 6.4 to 7.1 g/cm³.

2. The valve seat according to Claim 1, wherein the hard particles contain at least one selected from the group consisting of C, Cr, Mo, Co, Si, Ni, S, and Fe, and the content of the hard particles in the first iron-based sintered alloy member is 5 to 40 percent by area.

3. The valve seat according to Claim 1 or 2, wherein

the matrix phase and hard particles form a base portion; the base portion contains 10.0 to 40.0 percent by mass of at least one selected from the group consisting of Ni, Cr, Mo, Cu, Co, V, Mn, W, C, Si, and S, the Ni content being 2.0 to 23.0%, the Cr content being 0.4 to 15.0%, the Mo content being 3.0 to 15.0%, the Cu content being 0.2 to 3.0%, the Co content being 3.0 to 15.0%, the V content being 0.1 to 0.5%, the Mn content being 0.1 to 0.5%, the W content being 0.2 to 6.0%, the C content being 0.8 to 2.0%, the Si content being 0.1 to 1.0%, the S content being 0.1 to 1.0% on a mass basis, the balance being substantially Fe; and the matrix phase of the second iron-based sintered alloy member contains 0.3-15.0 percent by mass of at least one selected from the group consisting of C, Ni, Cr, Mo, Cu, Co, V, and Mn, the balance being substantially Fe.

4. The valve seat according to any one of Claims 1 to 3, wherein the first and second iron-based sintered alloy members further contain 0.3 to 3.5 percent by area of solid lubricant particles dispersed in the matrix phase.

5. The valve seat according to Claim 4, wherein the solid lubricant particles contain at least one selected from the group consisting of a sulfide, and a fluoride.

6. A method for manufacturing a valve seat containing an iron-based sintered alloy, comprising:

a forming step of filling a first raw material powder for forming a valve-seating section and a second raw material powder for forming a head-seating section into a metal mold one after another such that the first and second raw material powders form a double layer structure and then compacting the resulting first and second raw material powders to form a green compact consisting of two layers; and

a sintering step of heating the resulting green compact in a protective atmosphere to obtain a sintered body having a double layer construction,

wherein the first raw material powder contains 20 to 70% of a pure iron powder, 10 to 50% of a first ferroalloy powder, and 5 to 40% of a hard particle powder on a mass basis or further contains 0.2 to 3.0 parts by weight of a solid lubricant particle powder with respect to 100 parts by weight of the first raw material powder, the pure iron powder, first ferroalloy powder, and hard particle powder or solid lubricant particle powder being blended and mixed; the first ferroalloy powder contains 3 to 30 percent by mass of at least one selected from the group consisting of Ni, Cr, Mo, Cu, Co, V, Mn, W, and C, the balance being substantially Fe; the hard particle powder contains at least one selected

from the group consisting of C, Cr, Mo, Co, Si, Ni, S, and Fe; the second raw material powder contains 85% or more of the pure iron powder and 0.3 to 15% of a second ferroalloy powder on a mass basis or further contains 0.2 to 3.0 parts by weight of the solid lubricant particle powder with respect to 100 parts by weight of the second raw material powder, the pure iron powder and second ferroalloy powder or solid lubricant particle powder being blended and mixed; the second ferroalloy powder contains at least one selected from the group consisting of C, Ni, Cr, Mo, Cu, Co, V, and Mn; and conditions of the forming step and sintering step are adjusted such that the first iron-based sintered alloy member has a sintered density of 6.1 to 7.1 g/cm³ and a porosity of 10 to 25 percent by volume and the second iron-based sintered alloy member has a sintered density of 6.4 to 7.1 g/cm³ and a porosity of 10 to 20 percent by volume.

7. The method according to Claim 6, wherein the first raw material powder contains 0.3 to 15 percent by mass of an alloy element powder instead of part or the whole of the ferroalloy powder, and the alloy element powder contains at least one selected from the group consisting of Ni, Cr, Mo, Cu, Co, V, Mn, W, and C.